2017 Science On a Sphere®
Users Collaborative Network Workshop
Program & Agenda

POLE to POLE

Connecting people, places, animals and spaces

NATIONAL MARINE SANCTUARY FOUNDATION

NOAA

DETROIT ZOOLOGICAL SOCIETY
DETROIT ZOO • BELLE ISLE NATURE CENTER

Detroit Zoo
Royal Oak, MI
April 25-27, 2017

Contents

Welcome to the 8th Science On a Sphere® Users Collaborative Network Workshop!

Happy 10th anniversary to the SOS Users Collaborative Network! To celebrate our work together over the years, we have another great workshop for you with a mix of topics spanning technical subjects and programmatic areas. There are 56 presentations for you to consider attending and, we hope, to which you will contribute your thoughts. The 2017 workshop will focus on the theme, "Pole to Pole: Connecting people, places, animals and spaces." With the Detroit Zoological Society as our host, the first-ever zoo to host an SOS workshop, we will be able to explore the ways data visualization can aid in communicating messages about habitats, animals, humans, and the changes that are happening. We are also offering a new, "deeper dive" session that will occur the afternoon before the workshop officially begins. This, hands-on, small group session will offer an opportunity for a more intensive exploration of a topic: a new approach for interpretation for difficult topics like sea level rise, called "Visualizing Change". Also new, we will show the results of a student SOS contest. During the workshop we will discuss the process we used to engage students in creating content, what worked and didn't, and we will view the winning entry.

As a result of these new developments, we have added these objectives for this workshop:

- Understand the way a conservation organization like the Detroit Zoo uses its sphere;
- Develop and share new approaches for engaging students, teachers, and other youth, and;
- Explore usefulness of "deeper dive" sessions for workshop attendees.

And, the following "evergreen" objectives are still a core of what we will attempt to achieve with this workshop:

- Improve effectiveness of each institution's use of SOS and other spherical platforms;
- Evolve best practices for content creation and interpretation;
- Expand the breadth of approaches for engaging the public with science through spherical display systems;
- Understand the impact spherical display systems have on learning Earth system science in informal science education settings;
- Continue to inform the future direction of the SOS Network, and;
- Continue to grow a cohesive and collaborative network that is actively sharing information, expertise, and content.

We hope these Workshop offerings meet your needs and expectations. You'll have a chance to tell us if they did on the post-Workshop survey.

Also, we hope you'll take advantage of the less structured parts of the agenda to interact with your fellow attendees. We have extended the time devoted to morning and afternoon breaks to allow for impromptu network member discussion. We think you'll find you need this time as there is quite a diversity of expertise here with us. There are over 100 attendees from 6 different countries representing more than 50 institutions, including educators, visualizers, scientists, exhibit designers, movie producers, and technologists.

We are delighted to host this workshop in Metro Detroit, and are eager for you to experience our revitalizing city. The Detroit Zoological Society is pleased to be the first zoo to host this workshop, and we hope to contribute to the larger conversation around earth science and climate change education by adding stories of the life on our planet. Making personal connections to conservation stories is a guiding light in our education strategy, and we hope to continue using Science On a Sphere in more holistic ways to further that goal.

Finally, as with any workshop, there are many players that make the Workshop come together. This year, NOAA has had the pleasure of working with a great team from the Detroit Zoological Society lead by Ian McGuire, who would like to give special thanks to Ron Kagan, Diane Miller, Debi Rodriguez, and Claire Lannoye-Hall. Our sponsor, the National Marine Sanctuary Foundation is also an essential element that allows this Workshop to take place. Thanks to all of them for their efforts and support.

We hope you'll enjoy, be inspired by, try new things and help us foresee the next 10 years of this great network!

Sincerely,
Your Workshop organizers,
Carrie McDougall, Erik MacIntosh, Maggie Allen, Beth Russell, June Teisan, and Ian McGuire

Things to know

Wifi: Access will be provided in all workshop spaces.
SSID: SoSWorkshop
Password: W0rkSh0p

Social Media: Please use the hashtag #SOSWorkshop in social media posts about this workshop or tweet us @NOAAeducation and @detroitzoo

Breakfast: For Tuesday morning, full breakfast is being provided. For Wednesday and Thursday mornings, a continental breakfast will be provided at the Detroit Zoo. If you would like something more substantial, there are plenty of options available at the Renaissance Center before the buses depart.

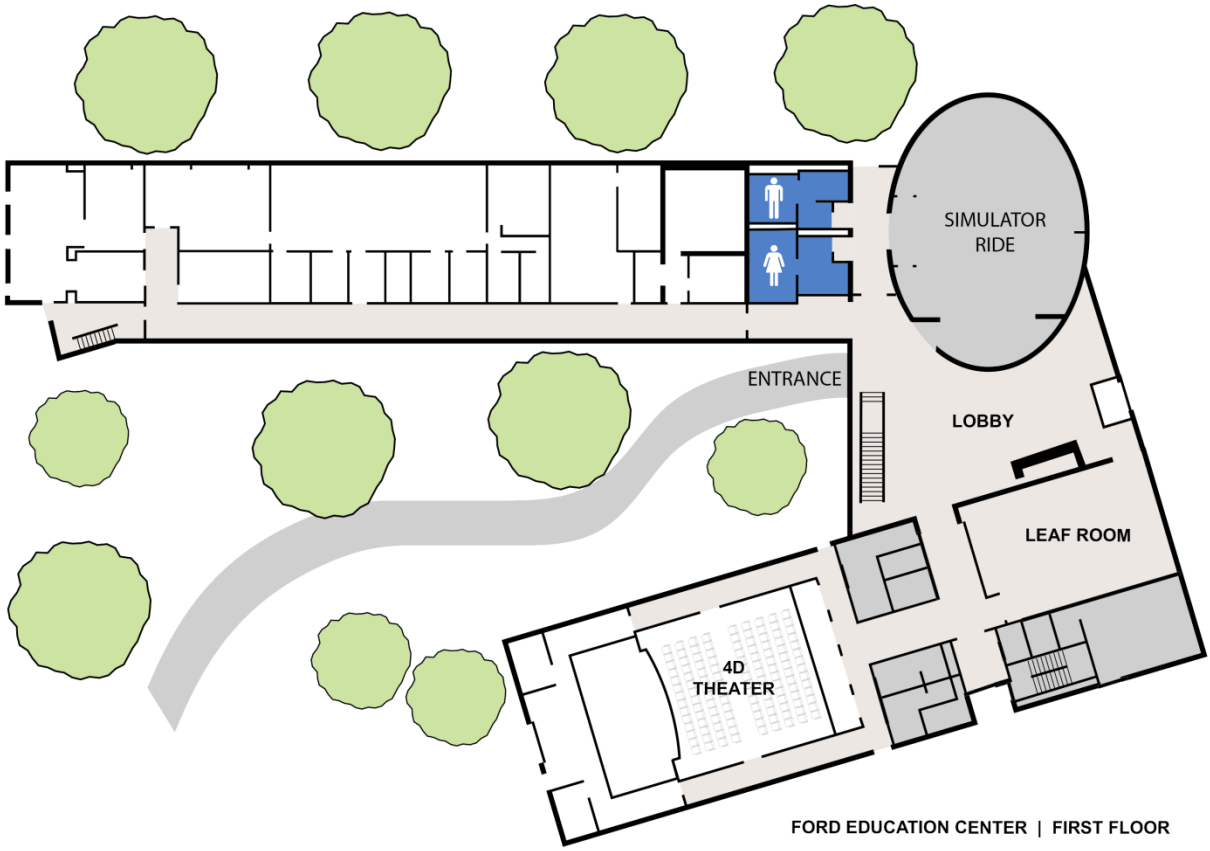
SOS location: Most workshop sessions are located in the Ford Education Center, however the Science On a Sphere exhibit is in the Wildlife Interpretive Gallery, located a short walk away. Zoo staff will be available to assist with wayfinding or accessibility needs.

Parking: For attendees who plan to drive to the zoo, Enter the Zoo via Gate 4 which is along the 10 Mile/ I-696 Service Drive. Stop at the security booth and let them know you are here for the Science On a Sphere Workshop. They will then direct you to the Rackham Fountain Entrance where you can park in any available space near the guard shack and walk to the Ford Education Center.

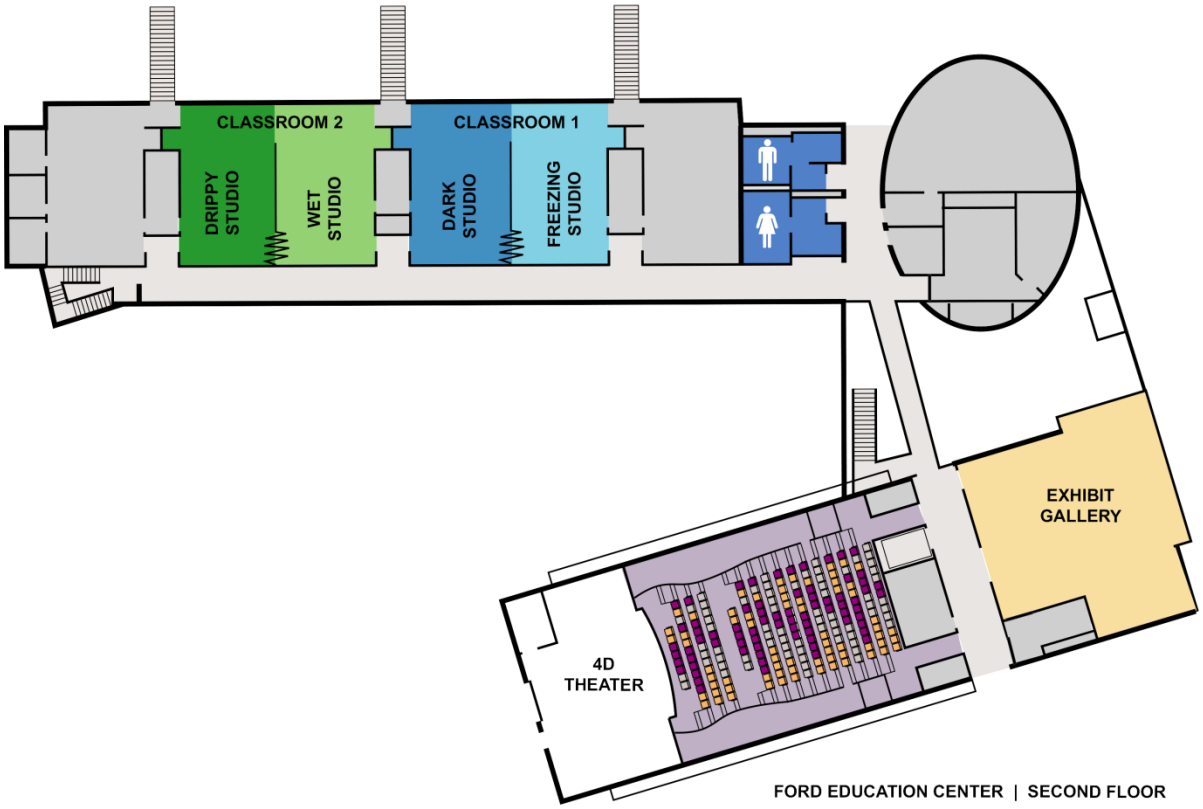
Programmatic vs Technical tracks: This year we have color-coded the Agenda-At-A-Glance based on the type of presentation. Green-colored sessions are more technical in nature and are more suited for attendees who have a deeper understanding of the nuts and bolts of SOS. Blue-colored sessions are more programmatic in nature and will more broadly applicable to educators and others dealing with the programmatic side.

Program format: All presentation titles in the Agenda-At-A-Glance and the Daily Schedule are hyperlinked to the talk description

Map of Ford Education Center



FORD EDUCATION CENTER | FIRST FLOOR



FORD EDUCATION CENTER | SECOND FLOOR

Map of Detroit Zoo Grounds

Bus Schedule

All buses will say Trinity Transportation on the side and will have the SOS workshop logo in the window

DTW Airport - There are two terminals – the bus will pick up at North Terminal pick up area, then loop around to the McNamara Terminal before heading to the hotel. Staff members from the Detroit Zoo will be stationed at the ground transportation area of each terminal to provide assistance.

Detroit Marriott at the Renaissance Center – the bus will pick up and drop off in the Motor Lobby. Hotel staff will be able to point you in the right direction.

Monday, April 24

Buses will leave from DTW airport to the hotel at 3:00, 6:00, and 8:00 pm
For Deeper Dives participants, a bus will leave the hotel at 11:00 am for the Detroit Zoo

Tuesday, April 25

Buses will leave the hotel at 7:45 am
Buses will leave the Detroit Zoo for the hotel at 8:00 pm and 8:30 pm

Wednesday, April 26

Buses will leave the hotel at 8:00 am
Buses will leave the Detroit Zoo for the hotel at 5:30 pm

Thursday, April 27

Buses will leave the hotel at 8:00 am
Buses will leave the Detroit Zoo for the hotel at 2:45 pm
Buses will leave the Detroit Zoo for DTW airport at 4:00 pm

Friday, April 28

Buses will leave the Detroit Marriott for DTW airport at 7:00 and 11:00 am

SOS Student Contest

As part of the 10th anniversary of the SOS network and in partnership with the Office of Education and the Office of Oceanic and Atmospheric Research, the SOS Student Contest invited K-12 and college students to create new maps, visualizations, and stories that share NOAA's mission in creative and innovative ways. The contest was intended to provide opportunities for students to learn about and create data visualizations, increase student awareness of SOS, engage students and teachers with NOAA science, encourage students and teachers to visit a nearby SOS institution, and get teachers involved in technology associated with data visualization.

The winners of the contest were students Rachel Stukenborg and Kaitlin Tomlinson of James Madison University. Their project, "Energy Poverty-SOS: The overarching problem of energy poverty", exemplified the thoughtful and innovative approach NOAA sought for this contest. The topic was timely, used the global nature of the sphere extremely well, and related to NOAA's mission. Their presentation will be 1:00-2:00 PM on Tuesday, April 25.

Extra Workshop Opportunities

Evening reception

Tuesday, April 25 from 5:30 – 8:30 pm

Meet in the Exhibit Gallery before heading to the Polk Penguin Conservation Center. Asian style stir-fry, a variety of heavy hors d'oeuvres, and drinks will be provided. Alcoholic beverages will be available at a cash bar.

Quick-Deploy SOS

A new version of the travelling SOS exhibit will be available to view in the Exhibit Gallery on Tuesday afternoon from 3:15 – 5:30 pm

Animal Encounters

Giraffe feed (weather-dependent)
- April 25 from 3:20 - 3:50 p.m. (30 max)
- April 26 from 3:20 - 3:50 p.m. (30 max)

Aviary mealworm feed
- April 25 from 3:20 - 3:50 p.m. (15 max)
- April 26 from 3:20 - 3:50 p.m. (15 max)

Amphibian behind the scene tour
- April 25 from 3:20 - 3:50 p.m. (15 max)
- April 26 from 3:20 - 3:50 p.m. (15 max)

Reptile behind the scene tour
- April 25 from 3:20 - 3:50 p.m. (15 max)
- April 26 from 3:20 - 3:50 p.m. (15 max)

Hospital Tour
- April 25 from 3:20 - 3:50 p.m. (30 max)

Commissary/ Enrichment Kitchen/ Greenhouse
- April 26 from 3:20 - 3:50 p.m. (15 max)

During the afternoon networking breaks on Tuesday and Wednesday, Zoo staff will offer attendees opportunities to get behind-the-scene encounters with some of the animals at the zoo. Space is limited, so sign-up sheets will be available during the morning break on Tuesday.

Mammals - Get a peek into what it takes to care for the mammals that call the Zoo home. You'll meet with mammal care staff and explore some of the tasks needed to care for the animals.

Reptiles - Visit behind the scenes in the Holden Reptile Conservation Center building. You'll be able to see areas not available for the public, learn about daily reptile care and hear about conservation projects, like the "headstarting" program for Blanding's turtles.

Amphibians- Visit behind the scenes in the National Amphibian Conservation Center. Amphibian staff will highlight different rooms and what each is used for. Conservation of amphibians are especially important and you'll learn about some incredible conservation projects, like the breeding program for the Dusky Gopher Frog.

Aviary - Meet a bird department keeper to see, hear and learn about some of the bird species in the aviary. Many birds know the sound of a clicker, and will come over to pick up some tasty treats from the staff during the experience.

Hospital - Visit the Detroit Zoo's state of the art Ruth Roby Glancy Animal Health Complex where many care takes place for a number of Zoo residents. The tour will showcase the rooms and tools needed to take care of many different animal species.

Commissary/Enrichment Kitchen/Greenhouse - Running the Detroit Zoo takes many hands, departments and resources. During this tour, you'll see where animal food is delivered and prepared, where unique opportunities for animals are planned and where all the plants grow for animal food, beautification of Zoo grounds and for animal habitats throughout the Zoo.

Agenda At-A-Glance – Day 1

	Tuesday, April 25, 2017			
	4D Theater	**SOS**	**Classroom 1**	**Classroom 2**
8:00 AM	Arrival, check-in, and breakfast (Lobby)			
8:15 AM				
8:30 AM				
8:45 AM				
9:00 AM	Welcome Remarks			
9:15 AM				
9:30 AM				
9:45 AM	Updates from the Boulder SOS Team			
10:00 AM				
10:15 AM				
10:30 AM				
10:45 AM	BREAK (30 min) - drinks and snacks (Leaf Room)			
11:00 AM				
11:15 AM	Keynote			
11:30 AM				
11:45 AM				
12:00 PM	12:00 - 1:00 PM LUNCH - food will be provided (Exhibit Gallery)			
12:15 PM				
12:30 PM				
12:45 PM				
1:00 PM		The Overarching Problem of Energy Poverty	Best Social Media Practices for Education	Volunteers and Interns, oh my! Building an efficient training program that increases recruitment and retention
1:15 PM				
1:30 PM			Amphibians and Climate Change	
1:45 PM				
2:00 PM				
2:15 PM		Tsunami Warning: Japan 2011	Take a closer look at SOS Explorer	Working with interns/volunteers to produce content
2:30 PM		Alien Earth		
2:45 PM		Reading Earth's Autobiography		Spherical Display Systems in Higher Education
3:00 PM				
3:15 PM	Networking break (45 min) - drinks and snacks (Exhibit Gallery) Animal Encounters Quick Deploy SOS (Exhibit Gallery)			
3:30 PM				
3:45 PM				
4:00 PM		(Sphere) What's New in the SOS Product Suite	Eco Impact: How Our Choices Affect the Earth and Its Inhabitants	What's New in the SOS Product Suite
4:15 PM				
4:30 PM		(Sphere) What's New in the SOS Product Suite		What's New in the SOS Product Suite
4:45 PM				
5:00 PM	Gather for reception (Exhibit Gallery) Quick Deploy SOS (Exhibit Gallery)			
5:15 PM				
5:30 PM	5:30 - 8:30 PM Reception (includes dinner)			

Legend:	Plenary	Programmatic	Technical

Agenda At-A-Glance – Day 2

	Wednesday, April 26, 2017			
	4D Theater	**SOS**	**Classroom 1**	**Classroom 2**
8:00 AM	Arrival and continental breakfast (Leaf Room)			
8:15 AM				
8:30 AM				
8:45 AM				
9:00 AM	Welcome			
9:15 AM	Keynote			
9:30 AM				
9:45 AM				
10:00 AM	Lightning talks			
10:15 AM				
10:30 AM	BREAK (30 min) - drinks and snacks (Leaf Room)			
10:45 AM				
11:00 AM			The Quarterly Climate Digest: a potential legacy product from the EarthNow project	Using NOAA Data in the Classroom to Integrate SOS and Classroom Instruction
11:15 AM				
11:30 AM			Impacts of climate change on polar bears and wolves	SOS Programs for Middle School Groups: Ready-to-implement lessons
11:45 AM				
12:00 PM	12:00 - 1:00 PM LUNCH - food will be provided (Exhibit Gallery)			
12:15 PM				
12:30 PM				
12:45 PM				
1:00 PM		Soft Science on a Sphere	Creating Content for the SOS: Data Visualization to Image Engagement	Building resilient communities – panel presentation
1:15 PM		Entertaining Potential Partners		
1:30 PM		Integrating Special Events		
1:45 PM				
2:00 PM				
2:15 PM		Exploring the Unknown Ocean		SOS in a Formal Education Laboratory
2:30 PM		New from NOAA: recent additions to the SOS catalog		
2:45 PM				
3:00 PM				
3:15 PM	Networking break (45 min) - drinks and snacks (Exhibit Gallery) Animal Encounters			
3:30 PM				
3:45 PM				
4:00 PM		Earth Revealed	SOS: Global to Local	A FUTURE WITHOUT EDGES: A Panel on the Intersection of VR and Spherical Productions
4:15 PM		Visualizing Change narrative		
4:30 PM		The climate gears		
4:45 PM				
5:00 PM		Student contest discussion	Piping Plover Conservation	
5:15 PM				
5:30 PM	Adjourn for day			

Legend:	Plenary	Programmatic	Technical

Agenda At-A-Glance – Day 3

	Thursday, April 27, 2017			
	4D Theater	**SOS**	**Classroom 1**	**Classroom 2**
8:00 AM	Arrival and continental breakfast (Leaf Room)			
8:15 AM				
8:30 AM				
8:45 AM				
9:00 AM	Final Day Remarks			
9:15 AM	Lightning Talks			
9:30 AM				
9:45 AM				
10:00 AM	Break (30 min) - drinks and snacks (Leaf Room)			
10:15 AM				
10:30 AM		Pale Blue Dot	SOS Visual Playlist Editor Tutorial	Evaluating SOS: A Smorgasbord Panel
10:45 AM		"Earth-like" Alien Planets?		
11:00 AM		Deep Time Tectonic Animation		
11:15 AM		Goddard's Site-Custom		
11:30 AM				
11:45 AM				
12:00 PM	12:00 - 1:00 PM LUNCH - food will be provided (Exhibit Gallery)			
12:15 PM				
12:30 PM				
12:45 PM				
1:00 PM		Pandas and Polar Bears	SOS Product Suite: Feedback and Future Direction	ROUND MOVIES – Production Techniques for SOS Filmmakers
1:15 PM		Expand Classroom Boundaries		
1:30 PM		Citizen Science On a Sphere		
1:45 PM				
2:00 PM	Closing Remarks			
2:15 PM				
2:30 PM	Workshop adjourns, explore Zoo or take bus back to Marriott			

Legend:	Plenary	Programmatic	Technical

Daily Schedule

Day 1 – Tuesday, April 25

7:45 AM	**Bus departs from Detroit Marriott**	
8:00 AM	**Check in** – breakfast served	*Lobby*
9:00 AM	**Welcome & Introductory Remarks from the Detroit Zoological Society and NOAA** Workshop hosts	*4D Theater*
9:45 AM	**Updates from the Boulder SOS Team** SOS Development Team	*4D Theater*
10:45 AM	BREAK – Drinks and snacks served	*Leaf Room*
11:15 AM	**KEYNOTE: Slipping Forward into the Past, a Predator's Perspective on Climate and Change in the Western Antarctic Peninsula Region** Dr. Bill Fraser	*4D Theater*
12:00 PM	**LUNCH** – food will be provided	*Exhibit Gallery*
1:00 PM	**The Overarching Problem of Energy Poverty [Student Contest Winners]** Rachel Stukenborg, Kaitlin Tomlinson	*SOS*
1:00 PM	**Best Social Media Practices for Education** Beth Russell	*Classroom1*
1:00 PM	**Volunteers and Interns, oh my! Building an efficient training program that increases recruitment and retention** Nick Corcoran, Sue Layton	*Classroom 2*
1:30 PM	**Amphibians and Climate Change** Ruth Marcec	*Classroom1*
2:15 PM	SOS Showcase	*SOS*
	Tsunami Warning: Japan 2011 Nathan Becker, Leon Geschwind	
	Alien Earth Dave Cuomo	
	Reading Earth's Autobiography – Paleoclimate Proxies Jeremy Hoffman	
2:15 PM	**Take a closer look at SOS Explorer** Hilary Peddicord, Eric Hackathorn	*Classroom1*

2:15 PM	**Working with interns/volunteers to produce content** Ian McGuire	*Classroom 2*
2:45 PM	**Spherical Display Systems in Higher Education** CJ Hartman	*Classroom 2*
3:15 PM	**Networking Break** – drinks and snacks served	*Exhibit Gallery*
	Quick Deploy SOS	
	Animal Encounters	
4:00 PM	**Eco Impact: How Our Choices Affect the Earth and Its Inhabitants** Lisa Forzley	*Classroom 1*
4:00 PM	**What's New in the SOS Product Suite** Keith Searight, Shilpi Gupta, Vincent Keller, Ian McGinnis	*Classroom 2* *SOS*
5:00 PM	**Gather for Reception**	*Exhibit Gallery*
	SOS Quick Deploy	
5:30 PM	**Evening Reception** – includes dinner	*Polk Penguin Conservation Center*

Day 2 – Wednesday, April 26

8:00 AM	**Bus departs from the Detroit Marriott**	
8:30 AM	**Check in** – continental breakfast served	*Lobby*
9:00 AM	**Welcome**	*4D Theater*
9:15 AM	**KEYNOTE: Detroit: Looking Back to Move Forward** William Winkel	*4D Theater*
10:00 AM	**Lightning Talks**	*4D Theater*
	A Sneak Peek at How Data in the Classroom Brings SOS to Grades 6-12 Dan Pisut	
	NASA GIBS & Worldview - Discover our Trove of Visualizations Matthew Cechini	
	Visualizing Destructive Tsunamis Nathan Becker	
10:30 AM	**BREAK** – drinks and snacks provided	*Leaf Room*
11:00 AM	**The Quarterly Climate Digest: a potential legacy product** Margaret Mooney, Patrick Rowley	*Classroom 1*
11:00 AM	**Using NOAA Data in the Classroom to Integrate SOS and Classroom Instruction** Dan Pisut	*Classroom 2*
11:30 AM	**Impacts of climate change on polar bears and wolves** Paul Buzzard	*Classroom 1*
11:30 AM	**SOS Programs for Middle School Groups: Ready-to-implement lessons and a teaching tutorial** CJ Hartman	*Classroom 2*
12:00 PM	**LUNCH** – food will be provided	*Exhibit Gallery*
1:00 PM	SOS Showcase	*SOS*
	Soft Science On a Sphere Katie Field	
	Entertaining Potential Partners and Donors Paul Arthur	
	Integrating Special Events with Science On a Sphere	

	Freya Berntson, Justin McAfee	
1:00 PM	**Creating Content for the SOS: Data Visualization to Image Engagement** Dan Pisut	*Classroom 1*
1:00 PM	**Building resilient communities: Panel Discussion** Carrie McDougall, Bryan Wunar, Francis Choi, Riley Young Morse	*Classroom 2*
2:15 PM	SOS Showcase	*SOS*
	Exploring the Unknown Ocean Holly Morin, Alex DeCiccio	
	New From NOAA: recent additions to the SOS Catalog Erik MacIntosh, Beth Russell	
2:15 PM	**SOS in a Formal Education Laboratory** Maurice Henderson	*Classroom 2*
3:15 PM	**Networking Break** – drinks and snacks served	*Exhibit Gallery*
	Animal Encounters	
4:00 PM	SOS Showcase	*SOS*
	Earth Revealed Katie Schweiger	
	Visualizing Change narrative Luke Richmond	
	The climate gears in the atmospheric machine Tom DiLiberto	
4:00 PM	**SOS: Global to Local** Shilpi Gupta, Kate Semmens, Nick Corcoran	*Classroom 1*
4:00 PM	**A Future Without Edges: A Panel on the Intersection of VR and Spherical Productions** Michael Starobin, Eric Hackathorn, Kate Raisz, Ian McGuire	*Classroom 2*
5:00 PM	**SOS Student Contest: Engaging youth in creating SOS content** Carrie McDougall	*SOS*
5:00 PM	**Piping Plover Conservation** Tom Schneider	*Classroom 1*
5:30 PM	**Adjourn for day** – buses will return to hotel	

Day 3 – Thursday, April 27

8:00 AM	**Bus departs from Detroit Marriott**	
8:30 AM	**Check in** – continental breakfast served	*Lobby*
9:00 AM	**Welcome**	*4D Theater*
9:15 AM	**Lightning Talks**	*4D Theater*
	Climate Connections in Virginia: Your Actions Matter Jeremy Hoffman	
	Connecting people to science through six degrees of influence Kate Semmens	
	School-Centered SOS Patrick Rowley	
	Stay Abreast! Join the SOS Education Forum Hilary Peddicord	
	Upgrading to 4K Erik MacIntosh	
10:00 AM	**BREAK** – drinks and snacks provided	*Leaf Room*
10:30 AM	SOS Showcase	*SOS*
	Pale Blue Dot Dave Cuomo	
	"Earth-like" Alien Planets? Make it interactive and engaging with simple materials and techniques Hilary Peddicord	
	Deep Time Tectonic Animation Kate Raisz	
	100 Nuggets: Goddard's Site-Custom Maurice Henderson	
10:30 AM	**SOS Visual Playlist Editor Tutorial** Shilpi Gupta, Vincent Keller	*Classroom 1*
10:30 AM	**Evaluating SOS: A Smorgasbord Panel** Carrie McDougall, Claire Lannoye-Hall, Alie LeBeau, Stephanie Uz, Megan Chen	*Classroom 2*

12:00 PM	**LUNCH** – food will be provided	*Exhibit Gallery*
1:00 PM	SOS Showcase	*SOS*
	Pandas and Polar Bears Patrick Rowley	
	Expand the Boundaries of a High School Classroom with SOS Darik Velez	
	Citizen Science On a Sphere Thomas Quayle	
1:00 PM	**SOS Product Suite: Feedback and Future Direction** Keith Searight, Shilpi Gupta, Vincent Keller, Ian McGinnis	*Classroom 1*
1:00 PM	**Round Movies – Production Techniques for SOS Filmmakers** Michael Starobin	*Classroom 2*
2:00 PM	**Closing Remarks**	*4D Theater*
2:30 PM	**Workshop Adjourns** – explore the zoo (optional), bus departs for hotel at 2:45 and DTW airport at 5:00 pm	

Plenary Descriptions

Welcome and Introductory Remarks from the Detroit Zoological Society and NOAA

Ron Kagan, Executive Director and Chief Executive Officer, Detroit Zoological Society
Louisa Koch, Director of Education, NOAA
Carrie McDougall, Senior Program Manager, NOAA Office of Education
Ian McGuire, Education Technology Specialist, Detroit Zoological Society
9:00 – 9:45 am, Tuesday, April 25 – 4D Theater

Workshop hosts will provide welcoming remarks and their perspectives on the field of informal science education and larger science education initiatives happening at the national level.

Updates from the Boulder SOS Team

John Schneider, Chief, Advanced Technology and Outreach, NOAA Global Systems Division
Beth Russell, Operations Manager, NOAA SOS Boulder
Keith Searight, Lead Software Engineer, NOAA SOS Boulder
Vincent Keller, SOS Developer, NOAA SOS Boulder
Ian McGinnis, Software Engineer, NOAA SOS Boulder
Shilpi Gupta, Software Engineer, NOAA SOS Boulder
Eric Hackathorn, Developer, NOAA SOS Boulder
Hilary Peddicord, Education Specialist, NOAA SOS Boulder
9:45 – 10:45 am, Tuesday, April 25 – 4D Theater

Get a full update from the Boulder SOS team. In this session we provide an overview on the state of SOS and future directions, cover all the new features of the 5.2 SOS release and provide a refresher on the 5.1 release, highlight the great new content added since the last workshop, and introduce the latest version of SOS Explorer and all the features that come along with it. We will leave time at the end for questions.

Keynotes

Dr. Bill Fraser
President and Lead Investigator, Polar Oceans Research Group

Slipping Forward into the Past, a Predator's Perspective on Climate and Change in the Western Antarctic Peninsula Region

11:15 am – 12:00 pm, Tuesday, April 25 – 4D Theater

Biography: Bill Fraser leads a non-profit research institution based in Sheridan, Montana, and serves as co-principal investigator of the Palmer Long Term Ecological Research Program in Antarctica (http://pal.lternet.edu/). He received a Ph.D. in Ecology from the University of Minnesota in 1989 and has been engaged in research on the ecology of seabirds in the Western Antarctic Peninsula region since 1974. His research focuses on the foraging ecology of seabirds, especially Adélie and other penguins, and their role as biological indicators of climate-induced changes in marine ecosystems.

William Winkel
Manager of the Detroit '67 Oral History Project**,** Detroit Historical Society

Detroit: Looking Back to Move Forward

9:15 – 10:00 am, Wednesday, April 26 – 4D Theater

Biography: William (Billy) Winkel is a curator at the Detroit Historical Society, where he works exclusively on the organization's Detroit 67 community engagement project. In addition to conducting original scholarly research on the causes, events and impacts of the events of July 67, he contributed two essays for the upcoming Wayne State University Press publication Detroit 67: Origins. Impacts. Legacies.

Lightning Talks

These are "rapid-fire" 5-minute presentations on topics of broad appeal to the majority of workshop attendees. There will be time for Q&A at the end of the session

A Sneak Peek at How Data in the Classroom Brings SOS to Grades 6-12

Dan Pisut, Program Manager, NOAA Visualization Lab
10:00 – 10:30 am, Wednesday, April 26 – 4D Theater

NASA GIBS & Worldview - Discover our Trove of Visualizations

Matthew Cechini, Lead Systems Engineer, NASA GIBS
10:00 – 10:30 am, Wednesday, April 26 – 4D Theater

Visualizing Destructive Tsunamis

Nathan Becker, Oceanographer, NOAA Pacific Tsunami Warning Center
10:00 – 10:30 am, Wednesday, April 26 – 4D Theater

Climate Connections in Virginia: Your Actions Matter

Jeremy Hoffman, Climate and Earth Science Specialist, Science Museum of Virginia
9:15 – 10:00 am, Thursday, April 27 – 4D Theater

Connecting people to science through six degrees of influence

Kate Semmens, Science Director, Nurture Nature Center
9:15 – 10:00 am, Thursday, April 27 – 4D Theater

School-Centered SOS

Patrick Rowley, Science On a Sphere Facilitator, James E. Richmond Science Center
9:15 – 10:00 am, Thursday, April 27 – 4D Theater

Stay Abreast! Join the SOS Education Forum

Hilary Peddicord, SOS Education Specialist, NOAA SOS Boulder
9:15 – 10:00 am, Thursday, April 27 – 4D Theater

Upgrading to 4K

Erik MacIntosh, SOS Coordinator, NOAA Silver Spring
9:15 – 10:00 am, Thursday, April 27 – 4D Theater

Session Descriptions

SOS Showcase

These sessions will use SOS to feature new content or docent presentations, either complete or in development. The SOS showcase is an opportunity for presenters to share and discuss new work. Presentations are generally limited to 20 minutes, including time for discussion.

Tsunami Warning: Japan 2011

Nathan Becker, Oceanographer, NOAA Pacific Tsunami Warning Center
Leon Geschwind, Education Technology Specialist, NOAA Office for Coastal Management
2:15 – 2:35 pm, Tuesday, April 25 – SOS

Like thunder following lightning, an earthquake's tsunami waves travel slower than its seismic waves, and this speed difference forms the basis of how NOAA's Pacific Tsunami Warning Center (PTWC) mitigates tsunami hazards when large earthquakes occur. PTWC continuously ingests data from a global network of land-based seismic sensors so when it detects an earthquake it immediately determines its size, location, and direction of movement then uses this information in numerical forecast models to predict a tsunami's behavior. PTWC also continuously ingests data from a global network of coastal and deep-ocean sea-level sensors to measure any tsunamis and then adjust its forecasts. Therefore, when a tsunami crosses an ocean basin, PTWC will use these forecast models to warn threatened populations in advance of the tsunami's arrival.

This presentation uses the sequence of events following Japan's 9.1 magnitude Great Tohoku-Oki Earthquake and its tsunami to illustrate how PTWC handles such tsunami threats. Computer-generated graphics and animations will show how the seismic and tsunami waves spread across the earth, how PTWC detected and measured them, and how and when PTWC issued tsunami warnings to nations throughout the Pacific Ocean over a 48-hour period.

Alien Earth

Dave Cuomo, Planetarium Supervisor, Pacific Science Center
2:35 – 2:55 pm, Tuesday, April 25 – SOS

Alien Earth is a live, 20 minute demo that features Science on a Sphere, a dynamic interactive data modeling tool. In this show, our guests will explore the different ways Earth has appeared in the past. Using these ancient, alien Earths as an analog, we then explore different places in the solar system which, while quite different than the Earth of today, are quite similar to the Earth of the past. Guests will gain an understanding that an "Earthlike" planet might be quite different from the Earth as seen today.

Reading Earth's Autobiography

Jeremy Hoffman, Climate and Earth Science Specialist, Science Museum of Virginia
2:55 – 3:15 pm, Tuesday, April 25 – SOS

Paleoclimatology, or the study of climate during times in Earth's history, is just one of the tools scientists leverage to characterize the unique role that humans are playing in the Earth system today. However, research suggests that paleoclimatology as a concept is relatively new in the public lexicon and remains one of the least-used words in the existing body of popular literature. This ultimately suggests that the public is most likely unaware of the knowledge the paleoclimate community has accumulated about global climate during recent Earth history and how that knowledge helps us to assess the human role in present climate change. As such, we have developed a new S.O.S. dataset entitled "Paleoclimate Proxies," which identifies the locations of 5 key groups of paleoclimate archives – ice cores, tree rings, ocean sediment cores, corals, and cave speleothems – and provides picture-in-picture representations of the archive and graphical interpretations of datasets from each archive. This dataset can be used to complement ongoing climate change engagement presentations used in museum and public spaces with S.O.S. technology.

Soft Science On a Sphere

Katie Feild, Planetarium Operator, Maryland Science Center
1:00 – 1:20 pm, Wednesday, April 26 – SOS

This presentation will showcase Maryland Science Center's customized visuals inspired by event and seasonal themes (including holidays) and creative use of the sphere.

Entertaining Potential Partners and Donors

Paul Arthur, Director, E.O. Wilson Biophilia Center
1:20 – 1:40 pm, Wednesday, April 26 – SOS

Come and see a fun and educational presentation using the SOS to impress potential donors, partners and clients. Presentations on educational content are great for actual lessons with students and visitors, but potential donors and partners want to see the full capabilities of the sphere. Knock their socks off with fun, informational, engaging, comical aspects of how the sphere can be catered to each potential client. You will be "struck" with great ideas to take back to your own SOS!

Integrating Special Events with SOS

Freya Berntson, School and Public Programs Manager, Science Central
Justin McAfee, Technology and Distance Learning Manager, Science Central
1:40 – 2:00 pm, Wednesday, April 26 – SOS

Discuss and discover how Science On a Sphere can be incorporated into every event your organization hosts. Science Central is a science museum that has a dedicated room for SOS. Each of our events offers a unique opportunity to utilize Science on A Sphere to enhance visitor engagement. We have turned our Sphere into a giant Pokéball during our Pokémon Meet-ups, displayed a global zombie epidemic during our zombie themed adult event, and used it for dramatic background elements during our adult Murder Mysteries. Join us for a conversation on the endless possibilities!

Exploring the Unknown Ocean

Holly Morin, Marine Research Associate III, University of Rhode Island – Inner Space Center
Alex DeCiccio, Media and Production, University of Rhode Island – Inner Space Center
2:15 – 2:35 pm, Wednesday, April 26 – SOS

The global ocean wraps 75% of our blue planet, yet less than 10% of the waters below its rippling surface have been explored. It was once thought that the ocean depths were devoid of life, the seafloor a barren, empty plain. However, advances in ocean science technologies are taking humans to previously unexplored ocean depths and are revealing unimaginable subsea landscapes teeming with life. The compelling story behind these technologies, the people that operate them, and the amazing discoveries they make together, are highlighted in a new, innovative SOS program developed by the Inner Space Center (ISC) at the University of Rhode Island Graduate School of Oceanography (URI/GSO). It features high-definition video footage of exciting deep-sea encounters, creatures found, and ecosystems charted; engaging scientist audio commentary; and imaginative technology visualizations and animations, all linked via inventive, sphere-based storytelling. This new program will be intended for use at informal science education institutions with SOS installations. It will incorporate options for science interpreters to expand on the content through audience engagement and offers the potential for incorporating live connectivity through the sphere in the future.

New from NOAA: Recent Additions to the SOS Catalog

Erik MacIntosh, SOS Coordinator, NOAA SOS Silver Spring
Beth Russell, SOS Operations Manager, NOAA SOS Boulder
2:35 – 3:00 pm, Wednesday, April 26 – SOS

In this session, we will review some of NOAA's newest additions to the SOS catalog. We will provide background on these datasets and lead a discussion on how to use and interpret them with public audiences. We will also preview some upcoming datasets that will be released soon.

Earth Revealed

Katie Schweiger, Manager, Specialized Experiences, Museum of Science and Industry
4:00 – 4:20 pm, Wednesday, April 26 – SOS

This is a presentation of our newest SOS programming focusing on how we as humans impact climate change. The program asks guests to think critically about their impact on our changing climate and what they can do on an individual, community, and global level to keep our earth a good place to live for years to come. This program focuses on reaching middle-school aged audiences, but is accessible for all ages.

Visualizing Change Narrative

Luke Richmond, Creative Arts & Science Education Supervisor, Aquarium of the Pacific
4:20 – 4:40 pm, Wednesday, April 26 – SOS

Over the past year, the Visualizing Change Project team has been testing four visual narratives that help to connect the public to climate science and community-level solutions. In particular, Climate Heart has helped the public understand the centrality of the ocean in regulating earth systems. This interpreter-facilitated show highlights key components of the Visualizing Change model: visuals paired with strategically-framed messages, leading to a discussion on solutions.

The climate gears in the atmospheric machine

Tom Diliberto, Meteorologist, NOAA Center for Weather & Climate Prediction
4:40 – 5:00 pm, Wednesday, April 26 – SOS

Most of us have heard the saying if you don't like the weather, wait 5 minutes. It's a beautifully concise synopsis of our chaotic atmosphere. While we know of the volatile nature of our day to day weather, our climate can be just as perplexing. From climate change to some of the natural climate gears that make our climate machine hum, our climate system has a huge impact on communities and ecosystems. Scientists' ability to predict our climate can be vitally important as a result. In this presentation using the SOS, we will learn how atmospheric climate rumblings thousands of miles away can decide on just how bad a winter (or summer) you may have, and how scientists piece together climate forecasts from monthly, to seasonal, to decadal timescales.

Pale Blue Dot

Dave Cuomo, Planetarium Supervisor, Pacific Science Center
10:30 – 10:50 am, Thursday, April 27 - SOS

Pale Blue Dot is an Astrobiology demonstration. The demonstration talks about using the Earth of the past as an analog, but talks about the Earth of the past not the Earth of today. For the demonstration I created datasets to represent Earth during the Hadean Eon, the Earth during the Archean Eon, and the Cryogenian Glaciation event (snowball Earth).

"Earth-like" Alien Planets? Make it interactive and engaging with simple materials and techniques

Hilary Peddicord, SOS Education Specialist, NOAA SOS Boulder
10:50 – 11:10 am, Thursday, April 27 - SOS

Thinking, voicing, listening to peers, and participating is more effective for learning than the old sit-and-get. With simple materials and engaging techniques you can make complex concepts easier to understand and more fun to learn about. In this particular lesson we will be deciphering what it means to be Earth-like. The news tells us that Kepler is out there finding Earth's siblings and cousins but what can we actually understand about a planet by looking at the shadow it makes?

Deep Time Tectonic Animation

Kate Raisz, Producer-Director, 42 Degrees North Media
11:10-11:30 am, Thursday, April 27 - SOS

Brand new 4K resolution animation of Ron Blakey's tectonic maps from 600 million years ago (mya) to today.

100 Nuggets: Goddard's Site-Custom

Maurice Henderson, Outreach Engineer, NASA Goddard Space Flight Center
11:45 am – 12:00 pm, Thursday, April 27 – SOS

Over the years we have been supporting scientists in their use of Science On a Sphere, and we have created many nuggets or clips just for them. We have listed 100 of our favorites, and will highlight 10 of them. The clips cover all of the science divisions of NASA starting with Earth Science, Helio-physics, Planetary Science, and Cosmology. During the talk we will briefly discuss techniques used to create the clips and why we have select them as gems or nuggets from our Site-Custom folder. All of these clips can be made available to other users.

Pandas and Polar Bears

Patrick Rowley, Science On a Sphere Facilitator, James E. Richmond Science Center
1:00 – 1:20 pm, Thursday, April 27 – SOS

The James E. Richmond Science Center facilitates field trips for around 25,000 students each year, primarily for students in Charles County (Maryland), aligned directly with our district's curriculum. This presentation will showcase excerpts from two SOS portions of our field trips, including a short SOS demo about panda habitats and deforestation, used for our fourth graders. Not only will I show a custom-made panda, but I will also show some deforestation maps, pulled from various sources but custom-designed for a story regarding pandas. Further, I will show a portion of a Polar Regions field trip, including quiz questions, polar bears, penguins, and people, used for our third graders.

Expand the Boundaries of a High School Classroom with SOS

Darik Velez, Director of the Science On a Sphere, St. Paul's School
1:20 – 1:40 pm, Thursday, April 27 – SOS

St. Paul's School is one of the only schools to have a dedicated SOS system. While integrating its use into the traditional curriculum presents its share of difficulties, it also allows students to learn and practice skills that are extremely applicable to the broader worlds of computer programing, data visualization, and presentation dynamics. Furthermore, students provide an ideal group to push the limits of the current SOS system and to suggest new ideas for future SOS development. Recent challenges and successes will be shared along with student-produced content.

Citizen Science On a Sphere

Thomas Quayle, Education Program Specialist, Clark Planetarium
1:40 – 2:00 pm, Thursday, April 27 – SOS

Citizen SOS is a process of learning, a tool and mechanism by which we discover how the world works. Often this process resides with trained professionals. However, the field of Citizen Science has grown rapidly in the last few years, with new projects and institutions eager to provide ways for the public to become engaged in many of these scientific processes. Citizen Science On a Sphere will present a list of possible partners, a methodology for grouping content and possible playlists that can be used by science institutions to take advantage of the global perspective that SOS provides to truly connect people with their world.

One example that will be discussed is Clark Planetarium's partnership with Tracy Aviary in a program called Moonwatch, in which the public attends evening events during the Full Moon to count the number of birds observed in flight. By pairing this information with bird migration maps from NOAA citizen science, we can see how projects such as this help develop a larger story in which the public can be involved.

Breakout Sessions

These sessions provide opportunities for more focused discussions or working groups. Topics in this category can include instructional sessions, working groups, small-group discussions, or presentations with a narrower focus.

The Overarching Problem of Energy Poverty [Student Contest Winners]

Rachel Stukenborg, student, James Madison University
Kaitlin Tomlinson, student, James Madison University
1:00 – 2:00 pm, Tuesday, April 25 – SOS

See the winners of the inaugural SOS Student Contest present the process they used for creating the winning entry for the contest. The purpose of this senior capstone project at James Madison University in the Department of Integrated Science and Technology was to develop a set of university-level teaching and learning resources about energy poverty that incorporate a spherical display system, Science On a Sphere (SOS). Four separate lesson "packages" regarding energy poverty were created. The first three explore the nature and consequences of energy poverty and are presented on SOS, while the fourth delves into the social, political, economic and cultural dynamics of sustainable solutions, and is taught after the SOS presentation. Each lesson package includes a background analysis, a comprehensive lesson plan, supporting teaching and learning resources, and a SOS "dataset" for select energy poverty indicators, such as access to non-solid fuels (percent of population by country).

Best Social Media Practices for Education

Beth Russell, SOS Operations Manager, NOAA SOS Boulder
1:00 – 1:30 pm, Tuesday, April 25 – Classroom 1

Social media is a powerful tool for connecting with visitors. You can announce upcoming events, engage with visitors, and provide educational material. This past fall, a video of the new earthquake dataset for SOS garnered over 7.6 million views! How can we harness that momentum and use social media as a platform for education and engagement? Do you know if you're posting a dud or a hit? What have you found to work well on your social media sites? In this session we'll share our ideas and successes and look for best practices.

Volunteers and Interns, oh my! Building an efficient training program that increases recruitment and retention

Nicholas Corcoran, Visitor Services Coordinator, The Wild Center
Sue Layton, Floor Staff Supervisor, Rochester Museum and Science Center
1:00 – 2:00 pm, Tuesday, April 25 – Classroom 2

Many institutions rely heavily on volunteers, docents, and interns to assist in programming. We faced initial challenges getting volunteers to use the sphere - older volunteers were concerned about the technical aspects and younger volunteers were nervous about talking to large crowds. Everyone was concerned that they had to memorize all 500+ datasets. We have worked to overcome these challenges and have had volunteers as young as 12 and as old as 80 try their hand at a sphere program. In this session we will share how to overcome fears, engage volunteers, and train them (even short term volunteers and interns) to lead high quality programs. We will also give examples of ways to getting people involved in a non-threatening or scary way. We will end by sharing out ideas and tips used by all institutions for training so that we can keep the momentum going.

Amphibians and Climate Change

Ruth Marcec, Director of the National Amphibian Conservation Center, Detroit Zoological Society
1:30 – 2:00 pm, Tuesday, April 25 – Classroom 1

This session is a special offering from the Detroit Zoo to highlight the creative ways they are incorporating climate change messages into their programs (although not necessarily related to SOS). As climate change educators, we feel it is important to flesh out our range of stories and ways to connect with audiences. Our hope is that by infusing real conservation efforts that are facing growing issues related to climate change we can offer workshop participants more storytelling tools.

Amphibians are undergoing a global extinction crisis. For the last two decades, declines in amphibian populations and species extinctions have occurred at an alarming rate. The causes of these declines are many, but the root of the declines and extinctions can often be traced back to global warming. Health and activity of amphibians is directly related to climate. With climate changes associated with global warming, amphibians are left more vulnerable to disease. Additionally, global warming has altered the environmental cues amphibians need in order to breed, hibernate, and behave naturally. Conservation programs for amphibians help to circumvent some of these problems associated with amphibian declines and assess wild populations to monitor survival, disease, and success.

Take a closer look at SOS Explorer

Hilary Peddicord, SOS Education Specialist, NOAA SOS Boulder
Eric Hackathorn, Developer, NOAA SOS Boulder
2:15 – 3:15 pm, Tuesday, April 25 – Classroom 1

SOS Explorer (SOSx) is a flat screen version of SOS developed by NOAA Boulder that incorporates visitor interactivity, 115 of SOS's best datasets, learning modules, data analysis tools, and immersive first-person experiences in an adaptable configuration perfect for small and portable educational settings. In this session, we will demonstrate the uses and personalized capabilities of SOSx as well as take your feedback and questions.

Working with interns and volunteers to produce content

Ian McGuire, Education Technology Specialist, Detroit Zoological Society
2:15 – 2:45 pm, Tuesday, April 25 – Classroom 2

You need help producing all of the content your institution desires, but have yet to master freezing time. How do you begin a program like this, and how can you further expand on it? I will share how my work on SOS content is influencing the way my institution grows, and where I hope to be in the coming years. Bring your experiences and be open to sharing the ways your institution deals with similar issues (or does not yet deal with them) - we will have time to discuss built into this talk!

Spherical Displays in Higher Education

CJ Hartman, Associate Professor, ISAT, James Madison University
2:45 – 3:15 pm, Tuesday, April 25 – Classroom 2

This interactive session will foster dialogue about opportunities to advance and expand the use of spherical display systems (SDS) in higher education. The session will begin with a short discussion of the results of a survey about higher education faculty members' perceptions and use of Science On a Sphere in instruction. Following discussion of the survey results, participants will engage in detailed introductions regarding their use of SDS in higher education and their related research, teaching, and service interests. Topics we will discuss as a group are facilitating communication between higher education institutions, sharing SDS educational materials for courses, and exploring research collaborations.

What's new in the SOS Product Suite

Keith Searight, SOS Technical Lear, NOAA SOS Boulder
Shilpi Gupta, SOS Software Engineer, NOAA SOS Boulder
Vincent Keller, SOS Developer, NOAA SOS Boulder
Ian McGinnis, Software Engineer, NOAA SOS Boulder
4:00 – 5:00 pm, Tuesday, April 25 – SOS and Classroom 2

Come see the latest and greatest in the SOS product suite from the Boulder SOS team. We'll have two simultaneous segments with live demos on the sphere and presentations in the auditorium covering the iPad, Kiosk, and much more. You'll learn more about how the newest SOS capabilities available now can enhance your audience's SOS experience. The sphere demos and auditorium presentations will be repeated halfway through the session so everyone will be able to see both segments.

Eco Impact: How Our Choices Affect the Earth and Its Inhabitants

Lisa Forzley, Curator of Education, Detroit Zoological Society
4:00 – 5:00 pm, Tuesday, April 25 – Classroom 1

This session is a special offering from the Detroit Zoo to highlight the creative ways they are incorporating climate change messages into their programs (although not necessarily related to SOS). As climate change educators, we feel it is important to flesh out our range of stories and ways to connect with audiences. Our hope is that by infusing real conservation efforts that are facing growing issues related to climate change we can offer workshop participants more storytelling tools.

It's important to provide our guests with information and data about climate change, but it's equally as important to empower individuals to make a positive difference. Making relevant connections to people's lives and providing the tools to make knowledgeable decisions on how to walk softly on the Earth, while treating all creatures gently, is key.

The Berman Academy for Humane Education, the lens through which all of the Detroit Zoological Society's learning initiatives are developed, works to instill values of respect, responsibility and compassion for all creatures. The Academy strives to foster a sense of understanding and appreciation of our environment as well as our responsibility to care for all of its inhabitants in a humane manner.

The Quarterly Climate Digest: a potential legacy project from the EarthNow project

Margaret Mooney, Director of Education and Public Outreach, Cooperative Institute for Meteorological Satellite Studies
Patrick Rowley, Science On a Sphere Facilitator, James E. Richmond Science Center
11:00 – 11:30 am, Wednesday, 26 – Classroom 1

The quarterly climate digest, produced seasonally, consists of a 4 minute movie for NOAA Science On a Sphere (SOS) and an MP4 video accessible through YouTube. Featuring highlights from the U.S. and global analysis issued by NOAA, the climate digest conveys a visual interpretation of weather and climate conditions worldwide. This is a potential legacy product of the EarthNow project out of the Cooperative Institute for Meteorological Satellite Studies (CIMSS) in collaboration with the NOAA Environmental Visualization Lab (EVL) and the Cooperative Institute for Climate and Satellites (CICS-MD). The content for this quarterly product was informed by evaluations garnered for the monthly climate digest, omitting things audiences found boring, such as statistics for individual countries, while retaining content that audiences found interesting, such as significant weather events. The streamlined movie retains global statistics while emphasizing seasonal statistics for the U.S. The digest also includes seasonal outlooks for both temperature and precipitation using NOAA's Climate Prediction Center data for the U.S. and global data provided by the International Research Institute for Climate and Society (IRI). The IRI global product provides a unique comprehensive prognostic outlook. Along with discussions of the quarterly climate digest, this presentation will discuss the evolution of the EarthNow project and highlight a few feature stories available on the EarthNow Blog at http://sphere.ssec.wisc.edu/

Using NOAA Data in the Classroom to Integrate SOS and Classroom Activities

Dan Pisut, Program Manager, NOAA Visualization Lab
11:00 – 11:30 am, Wednesday, April 26 – Classroom 2

For several years, the NOAA View data imagery portal has been a way to access additional datasets for the SOS. Now with the integration with Esri's Server and Portal technologies, web based data systems, it is easier than ever to create content for the classroom that is also available on the SOS…without any computer programming. In this presentation we'll cover how NOAA View can be used to create interactive presentations, kiosks, classroom activities, and other applications using free, online software. We will also demonstrate the newly revised Data in the Classroom modules that provide structured classroom activities on a variety of Earth systems science topics.

Impacts of climate change on polar bears and wolves

Paul Buzzard, Director of Conservation, Detroit Zoological Society
11:30 am – 12:00 pm, Wednesday, April 26 – Classroom 1

This session is a special offering from the Detroit Zoo to highlight the creative ways they are incorporating climate change messages into their programs (although not necessarily related to SOS). As climate change educators, we feel it is important to flesh out our range of stories and ways to connect with audiences. Our hope is that by infusing real conservation efforts that are facing growing issues related to climate change we can offer workshop participants more storytelling tools.

Climate change is having an impact on large carnivores, for example, changing the habitable range of polar and grizzly bears making them compete for shared resources. We will look at two case studies during this session: Kaktovik, Alaska to talk about potential costs and benefits of having more bears in town as well as ways to mitigate human-bear conflict as well as the case study of wolves at Isle Royale. For those wolves, climate change has reduced ice bridges to the mainland and consequently limited gene dispersal for wolves. The wolves and their primary prey, moose, are monitored as part of a 57-year study, the longest continuous study of a predator-prey system, and the wolf population on the island is functionally extinct. The national park service recently introduced a draft proposal to reintroduce wolves, and we will discuss the future management of Isle Royale especially with respect to other "islands" of protected habitat around the world.

SOS Programs for Middle School Groups: Ready-to-implement lessons and a teaching tutorial

CJ Hartman, Associate Professor, ISAT, James Madison University
11:30 am – 12:00 pm, Wednesday, April 26 – Classroom 2

A teaching tutorial and three original lessons are available to support use of Science On a Sphere (SOS) as a pedagogical tool for middle school groups. The purpose of this presentation is to introduce SOS Users Collaborative Network members to the resource and to invite them to later watch the tutorial, pilot the lessons, and provide feedback. Participants in this session will receive a link to the materials and a link to an online feedback form. The video tutorial is a recording of an interactive climate model lesson interspersed with commentary regarding teaching practices. The video contains three parts: (a) framing discussion in the classroom prior to using SOS, (b) using the SOS climate model datasets, including providing handouts with guided questions, orienting students to the visualization, and viewing the visualization multiple times, and (c) using a flat screen for summary and assessment. There are three original middle school level lessons: Hurricanes, Tornadoes, and, Global Climate Change. Lessons include learning objectives, corresponding learning standards, an instructor script, corresponding existing datasets, student handouts/worksheets with answers, presentation tips, a list of FAQs with answers, and multiple choice pre- and post-lesson assessments. An adaptation of "Lessons for Teachers No. 1: Map versus Globe" (from the NOAA Research-Forecast Systems Laboratory) is also included and can be used to orient students to the spherical display prior to beginning the other lessons.

Creating Content for the SOS: Data Visualization to Image Engagement

Dan Pisut, Program Manager, NOAA Visualization Lab
1:00 – 3:15 pm, Wednesday, April 26 – Classroom 1

Creating custom data visualizations for your SOS is not as difficult as it seems. This short-course is intended to give participants a broad overview in creating content for the SOS, and will include: finding data and easy-to-use software for visualizing it, modifying pre-existing imagery, and simple tips and tricks to enhance your visualizations in Adobe Photoshop and After Effects.

As this is course is taught in a lab format, we suggest that all participants have access to a laptop and Adobe Photoshop. After Effects is also recommended but not required. Basic familiarity with Photoshop is expected.

Building resilient communities: engaging youth and using visualizations to prepare communities for environmental hazards and other changes.

Carrie McDougall, Senior Program Manager, NOAA Office of Education
Bryan Wunar, Director of Community Initiatives, Museum of Science and Industry
Francis Choi, Research Technician, Northeastern University
Riley Young Morse, Program Manager, Gulf of Maine Research Institute
1:00 – 2:00 pm, Wednesday, April 26 – Classroom 2

Join us for a panel presentation and discussion on how NOAA's informal education institution grantees are engaging youth and using visualizations to build environmental literacy to support resilient communities. Using existing after school and field trip programs, and tested models for engaging adults, these institutions are incorporating the latest information about and visualizations of sea level rise, heat waves, extreme storms, and drought. Through these programs youth and adults will become more aware of the issues facing their communities and what ways they can be involved in the processes to make their communities more resilient.

SOS in a Formal Education Laboratory

Maurice Henderson, Outreach Engineer, NASA Goddard Space Flight Center
2:15 – 3:15 pm, Wednesday, April 26 – Classroom 2

The Science on a Sphere is the newest resource at Central Virginia's STEM Center, the MathScience Innovation Center (MSiC). During this workshop session, participants will be introduced to the MSiC and how the work of the Center reaches students, teachers, higher educational, industry and community leaders through engaging curriculum and specialized learning spaces. Focusing on the goal of engaging students in research, collaboration and communication, participants will work in small networking and brainstorming groups to discuss ways in which we can ensure that students become more than viewers of the sphere but data miners, researchers, and curators of content and knowledge.

Participants will discuss the educational role the SOS will have on the wide range of individuals reached by this resource irrespective of geographic, economic and prior experiences they may have. They will have the opportunity to brainstorm ways to incorporate the SOS into STEM-related projects involving Earth Systems from a local and global perspective. In addition, participants will be introduced to the ways in which the MSiC plans to incorporate the SOS into professional development programs for K-12 teachers.

SOS: Global to Local

Shilpi Gupta, SOS Software Engineer, NOAA SOS Boulder
Kate Semmens, Science Director, Nurture Nature Center
Nick Corcoran, Visitor Services Coordinator, The Wild Center
4:00 – 5:00 pm, Wednesday, April 26 – Classroom 1

The focus of this small-group discussion is how we can use Science On a Sphere® (SOS) to navigate between global and local data to relate information to an audience on a personal level that might inspire behavior change towards actionable stewardship and conservation. We will brainstorm the "What can I do about it now" question. We will discuss ideas and approaches for presenters to incorporate into their SOS programs that foster a personal connection between SOS material and the audience.

A Future Without Edges: The Intersection of VR and Spherical Productions

Michael Starobin, Senior Producer, NASA Goddard Space Flight Center
Eric Hackathorn, Developer , NOAA SOS Boulder
Kate Raisz, Producer-Director , 42 Degrees North Media
Ian McGuire, Education Technology Specialist, Detroit Zoological Society
4:00 – 5:30 pm, Wednesday, April 26 – Classroom 2

Join us for a panel presentation and discussion of the intersection of virtual reality, 360 videography, and spherical productions. Virtual reality promises to be the next big transformation in a long history of visual storytelling. For producers of spherical content, VR utilizes several techniques and technologies that should already be familiar. At the same time, new 360 filming technology that is being used to create original content for headsets like the Samsung Gear, Google Cardboard and Oculus Rift can be turned inside out to create seamless content for SOS. Producers familiar with both will discuss how they are integrating video content across these different platforms.

SOS Student Contest: Engaging youth in creating SOS content

Carrie McDougall, Senior Program Manage, NOAA Office of Education
5:00 – 5:30 pm, Wednesday, April 26 – SOS

Join a discussion of how to best engage youth in creating new content for SOS. Share your experiences with other contests or challenges or work you've done to engage youth locally.

Piping Plover Conservation

Tom Schneider, Curator of Birds, Detroit Zoological Society
5:00 – 5:30 pm, Wednesday, April 26 – Classroom 1

This session is a special offering from the Detroit Zoo to highlight the creative ways they are incorporating climate change messages into their programs (although not necessarily related to SOS). As climate change educators, we feel it is important to flesh out our range of stories and ways to connect with audiences. Our hope is that by infusing real conservation efforts that are facing growing issues related to climate change we can offer workshop participants more storytelling tools.

Piping plovers are tiny shorebirds that make shallow nests in the summer on flat, open, sandy beaches in northern Michigan – the same beaches that attract people, their pets and development. In 1986 there were only 17 nesting pairs of this endangered species remaining in the Great Lakes, and a federal recovery program was established by the United States Fish and Wildlife Service (USFWS). Scientists found that some of the plovers were abandoning their eggs, and they realized that salvaging these abandoned eggs could contribute significantly to the species' recovery. In this session we detail this interesting and challenging work.

SOS Visual Playlist Editor Tutorial

Shilpi Gupta, SOS Software Engineer, NOAA SOS Boulder
Vincent Keller, SOS Developer, NOAA SOS Boulder
10:30 am – 12:00 pm, Thursday, April 27 – Classroom 1

In this session, we will demonstrate step-by-step instructions on how to use all features of the SOS Visual Playlist Editor (VPLE). We will show how to (1) create a presentation playlist, (2) assemble a custom SOS dataset, and (3) modify an existing SOS dataset to make it your own. In addition, we will demonstrate how to use a new feature called TextPIPs which allows you to display text on the sphere (thereby eliminating the need to use tools such as Photoshop to create text image files). This workshop is designed for SOS presenters creating presentation playlists and for content creators creating custom datasets.

Evaluating SOS: A Smorgasbord Panel

Carrie McDougall, Senior Program Manager, NOAA Office of Education
Alie LeBeau, Education Programs Manager, Aquarium of the Pacific
Megan Chen, Ocean Education Specialist, Smithsonian Natural History Museum
Stephanie Uz, Scientist and Communication Coordinator, NASA Goddard Space Flight Center
Claire Lannoye-Hall, Curator of Education, Detroit Zoological Society
10:30 am – 12:00 pm, Thursday, April 27 – Classroom 2

Come learn about all of the evaluations that network members have conducted over the past 10 years. Panelists from network institutions will share findings from recent efforts, tips and tricks to creating and implementing a successful evaluation plan, and suggestions how to effectively analyze the data once it has been collected – resulting in data-driven improvements to programming. See the collection of reports here: http://www.noaa.gov/sosnetwork/evaluations

SOS Product Suite: Feedback and Future Direction

Keith Searight, SOS Technical Lear, NOAA SOS Boulder
Shilpi Gupta, SOS Software Engineer, NOAA SOS Boulder
Vincent Keller, SOS Developer, NOAA SOS Boulder
Ian McGinnis, Software Engineer, NOAA SOS Boulder
1:00 – 2:00 pm, Thursday, April 27 – Classroom 1

Meet with the SOS development team to have a dialogue on the whole SOS product suite and where we're heading. Come and discuss with us what parts of our software are working well for you, what's missing or challenging, and what you'd like most to enhance SOS at your venue.

Round Movies – Production Techniques for SOS Filmmakers

Michael Starobin, Senior Producer, NASA Goddard Space Flight Center
1:00 – 2:00 pm, Thursday, April 27 – Classroom 2

Where global data visualizations fit naturally on the screen, non-spherical subjects require specialized solutions. With this year's conference focused on People, Places, Animals, and Spaces, it stands to reason that new Sphere content should be able to portray stories featuring those subjects, in addition to traditional data visualizations.

This presentation will discuss practical production strategies for SOS filmmakers to depict real-world locations and subjects that are not inherently spherical. It will address strategies for production design, videography, pre-production plans for CG elements, and basic editing solutions.